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Brief Communication

From Positive Sign to Self-Management: Real-Time Interruption Training in Functional Seizures

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ABSTRACT: Functional seizures are diagnosed through positive clinical and electroclinical features, but translating diagnosis into immediate self-management remains challenging. We describe seven consecutive patients in whom an observed functional or suspected functional seizure was used to teach event interruption through alternating finger tapping and conversational attentional redirection, followed by box breathing for self-management. Habitual events lasted a median of 10 minutes (range 4–45). Six patients able to actively participate demonstrated interruption within approximately 15–60 s and subsequently self-interrupted events within 7 days, four within 48 hours. Real-time demonstration of symptom modifiability may translate a positive functional sign into an immediately actionable self-management strategy.

RÉSUMÉ: Du signe clinique positif à l'autoprise en charge : apprentissage de l'interruption en temps réel lors de crises fonctionnelles. Les crises fonctionnelles sont diagnostiquées à partir de signes cliniques et électro-cliniques positifs, mais il demeure difficile de traduire un tel diagnostic en une autoprise en charge immédiate. Nous voulons décrire ici les cas de sept patients vus consécutivement chez lesquels une crise fonctionnelle observée ou présumée a été mise à profit pour enseigner l'interruption de l'épisode convulsif par une alternance de tapotements des doigts et de redirection de l'attention par la conversation, le tout suivi d'une respiration carrée (*box breathing*) en vue d'une autoprise en charge. Les crises fonctionnelles habituelles duraient en moyenne 10 minutes (intervalle de 4 à 45 minutes). Six patients capables de participer activement ont réussi à interrompre leur crise dans un délai d'environ 15 à 60 secondes et ont par la suite réussi à les interrompre eux-mêmes en moins de 7 jours, dont quatre en moins de 48 heures. La démonstration en temps réel de la modifiabilité des symptômes peut donc permettre de transformer un signe clinique positif en une stratégie d'autoprise en charge immédiatement applicable.

Keywords: Functional neurologic disorder; functional seizures; seizures; self management

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Functional seizures (FSs) are paroxysmal events that resemble epileptic seizures but occur without the ictal electrophysiologic activity of epilepsy. Contemporary diagnosis emphasizes positive semiologic and electroclinical features rather than exclusion alone.[1,2] Treatment similarly emphasizes clear diagnostic communication, self-efficacy and active self-management. The recent American Academy of Neurology practice guideline recommends psychological interventions and explicitly encourages strategies that promote self-management and self-efficacy.[3] Established treatments include functional seizure-specific cognitive behavioral therapy and Retraining and Control Therapy, while attention redirection and movement retraining are established principles in functional motor disorder rehabilitation.[4–7] We explored whether an observed habitual event could itself provide an opportunity to demonstrate symptom modifiability and immediately translate that experience into a patient-directed interruption strategy.

We retrospectively describe seven consecutive patients evaluated in outpatient neurology or emergency settings for recurrent functional or clinically suspected functional seizure-like events in whom the same bedside interruption approach was attempted during an observed habitual event. Diagnostic assessment incorporated semiology, direct clinical observation and available electroencephalographic data. Because habitual events were not captured electrophysiologically in every patient, diagnostic certainty varied across the cohort. Response to the maneuver was not used to establish the diagnosis of FS.

During an ongoing event, patients who could participate were encouraged to perform alternating finger tapping while simultaneously engaging in conversation about a personally salient neutral or positive topic, such as family, work, hobbies or pets. This introduced a competing voluntary motor task while redirecting attention away from the abnormal movement. Once the event diminished or stopped, the observed modifiability was explained without suggesting voluntary symptom production. Patients were then taught to deploy alternating tapping at the earliest recognition of an event or premonitory sensation, followed by box breathing as an additional attentional and autonomic regulation strategy. Box breathing was taught to all seven patients.

Habitual events had been present for 1–18 months and occurred from three times weekly to ten times daily (Table 1).

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Table 1. Clinical Characteristics, Electrodiagnostic Findings and Response to Bedside Interruption Training. Seven consecutive patients with functional or clinically suspected functional seizure-like events. Baseline frequency and duration were patient-or caregiver-reported; observed response reflects the clinician-guided maneuver during the clinical encounter. aEEG = ambulatory EEG; ED = emergency department; GAD = generalized anxiety disorder; MDD = major depressive disorder; PTSD = post-traumatic stress disorder; vEEG = video-EEG. Bedside strategy: Alternating finger tapping with conversational attentional redirection when the patient could participate, followed by instruction in box breathing. Patient 4 could not perform tapping or conversation during the observed event and improved with calming/reassurance; subsequent home response was variable

Pt	Age / sex	Setting	Psychiatric history	Semiology	Symptom duration before training	Baseline event frequency	Typical event duration	EEG/video-EEG/aEEG findings	Observed response to clinician-guided maneuver	Independent self-interruption	Follow-up
1	24 F	Office	GAD	Head shaking; eyes closed	6 mo	2/day	5 min	72-h vEEG: no epileptiform discharges; habitual event not captured	Tapping + conversation interrupted event within 1 min	Yes; by day 2	1 mo
2	84 M	ED	No prior psychiatric history; retrospective history revealed minor childhood trauma	Recurrent prolonged large-amplitude movements with stuttering	3 mo	3/day	10 min	aEEG during event: mild alpha desynchronization with muscle artifact	First event interrupted within 1 min; second within 30 s	Yes; subsequently<15 s; by day 1	3 mo
3	18 F	Office	MDD	Head nodding and back arching	1 mo	10/day	45 min	96-h ambulatory EEG with video: beta/muscle artifact during event	Event interrupted within 30 s	Yes; learned to interrupt during aura; day 0	2 mo
4	25 F	ED	PTSD; bipolar II disorder	Generalized tonic-clonic-appearing event; eyes closed	18 mo	Weekly	10 min	vEEG during event: muscle artifact with alpha desynchronization	Unable to perform tapping/conversation during event; event stopped within ~5min with calming/ reassurance	Variable; able to interrupt some events at home with family reassurance/ conversation	4 mo
5	45 M	ED	No prior psychiatric history; personal and financial stress	Head nodding; eyes closed	3 mo	2/day	15 min	aEEG: negative for epileptiform abnormalities; no habitual event captured	Event interrupted within 30 s	Yes; by day 7	3 mo
6	70 M	Office	MDD	Involuntary bilateral upper-extremity large-amplitude tremor with speech stuttering	6 mo	3/week	20 min	aEEG: no epileptiform abnormality; muscle and blinking artifact only	Event interrupted within 30 s	Yes; by day 7	2 mo
7	65 F	ED	PTSD; MDD	Involuntary facial and bilateral upper-extremity spasms	6 wk	Daily	4 min	EEG with habitual event captured: muscle artifact; no reported epileptiform correlate	Event interrupted within 15 s	Yes; by day 2	1 mo

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Typical event duration was patient-reported and ranged from 4–45 minutes (mean 15.6; median 10 minutes). Semiology included head shaking or nodding, large-amplitude bilateral upper-extremity movements, back arching, stuttering, facial spasms and generalized convulsive-appearing activity. Several patients demonstrated prolonged events, eye closure, variability or responsiveness to attentional manipulation, features supportive of a functional etiology.[8]

Six of seven patients were sufficiently responsive during the observed event to participate actively in the motor-attentional maneuver. In these six, interruption occurred approximately 15–60 s after initiation of the maneuver. All six subsequently reported successful patient-directed interruption of recurrent events within seven days of teaching; four achieved this within 48 hours. This occurred despite symptoms having persisted for months in most patients and despite four patients experiencing multiple events daily.

The most striking example was an 18-year-old experiencing approximately ten events daily, typically lasting 45 minutes, whose observed event was interrupted within 30 s; she subsequently began deploying the strategy during a recognizable pre-event aura. An 84-year-old with three approximately 10-minute events daily initially required about 60 s for clinician-guided interruption, about 30 s during a second attempt, and subsequently reported independent interruption within 15 s. The single patient unable to participate actively during a generalized convulsive-appearing event could not perform tapping or sustain conversation; the event gradually resolved over approximately five minutes with calming measures. She later reported variable benefit from family-assisted reassuring conversation.

Where habitual events were captured electrophysiologically, no ictal epileptiform evolution was identified; recordings demonstrated variable muscle or blinking artifact and attentional background changes. These observations supported electroclinical characterization in selected patients but were not interpreted as establishing the mechanism of interruption. Conversely, a negative ambulatory or video electroencephalogram without capture of a habitual event was not considered sufficient to exclude epilepsy.[1]

The principal observation is not that distraction can modify functional symptoms. Distractibility, variability, altered attention and preserved access to normal movement patterns are established features of functional neurological disorder, and attention redirection is incorporated into rehabilitation.[7,9] Breathing, grounding and self-management strategies are also established components of functional seizure care.[3] Rather, the potentially useful observation is the immediate conversion of demonstrated symptom modifiability into an experiential self-management exercise. The patient does not merely receive an explanation that the symptom may be reversible; the patient experiences modifiability during the habitual event and is then taught to reproduce the strategy independently.

Conceptually, this sequence can be framed as positive functional sign, experienced symptom modifiability, explanation of preserved capacity, guided practice and patient-directed interruption (Figure 1). We suggest that this represents a potential therapeutic use of a positive functional sign. This framing is compatible with contemporary models emphasizing altered attention, expectation, agency and learned motor patterns in functional neurological disorder while avoiding any implication that symptoms are consciously produced.[9]

The rapid transfer from clinician guidance to self-management warrants prospective study. All six participating patients reported independent interruption within seven days despite a median historical event duration of 10 minutes and substantial preceding symptom burden. However, historical event duration was patient-reported whereas interruption latency during the clinical encounter was observed, precluding a valid quantitative comparison. Spontaneous termination, expectancy effects, therapeutic attention, regression toward the mean and natural event variability cannot be separated from intervention effects.

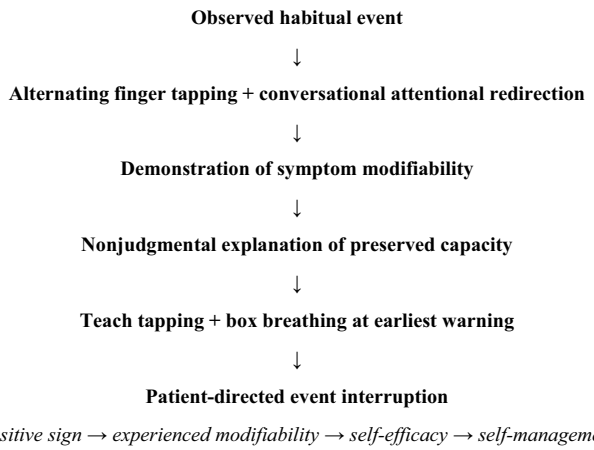


Figure 1. Proposed bedside framework. Proposed framework for translating an observed positive functional phenomenon into a patient-directed event-management strategy. The model is hypothesis-generating and should not be interpreted as a diagnostic test for functional seizures or as an established therapeutic protocol.

This series is small, uncontrolled, retrospective and clinically heterogeneous. Diagnostic certainty was not uniform because habitual events were not captured on video-EEG in every patient. The intervention was clinically reproducible but not prospectively protocolized, and outcomes after the encounter were based primarily on patient or caregiver report. Follow-up ranged from one to four months, and systematic data regarding total event frequency, quality of life, functional recovery and health-care utilization were not collected. Most importantly, response to the maneuver should not be considered diagnostic of FS, and these observations establish neither diagnostic specificity nor therapeutic efficacy.

These findings instead generate a testable hypothesis: whether using an ongoing functional event to demonstrate modifiability and immediately rehearse patient-directed control accelerates acquisition of self-management skills beyond diagnostic explanation alone. A prospective study could standardize the intervention, classify diagnostic certainty, measure interruption latency prospectively, use event diaries and validated patient-reported outcomes and compare diagnostic explanation alone with explanation plus real-time interruption training. In selected patients who remain sufficiently responsive to participate, transforming a positive functional sign from something the clinician observes into something the patient learns to reproduce may provide a simple bridge between diagnosis and self-management.

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Author contributions. ML conceived the clinical approach, identified and evaluated the cases, interpreted the clinical and electrodiagnostic data, developed the manuscript concept and reviewed and approved the final manuscript.

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Ethics statement. This retrospective consecutive case series was reviewed by the UnityPoint Health Institutional Review Board (IRB); an IRB protocol/determination number was not required. All patients provided verbal informed consent for inclusion of their clinical information in this case series, and written informed consent for publication was subsequently obtained from all participants. All clinical information was de-identified, and the study was conducted in accordance with applicable institutional ethical standards and the principles of the Declaration of Helsinki.

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